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EXAMINER

OLTMANS, ANDREW L

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/077,307

Applicant(s)

RAYBOULD ET AL.

Examiner

Andrew L Oltmans

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 16-25 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 23 is objected to because of the following informalities:

Claim 23 does not end with a period and contains a period at the end of line 2.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 17-19 and 21-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. The phrase “a protective coating” in the last two lines of claim 17 render the claim indefinite because the antecedent basis of “a protective coating” is unclear. In line 3, the method includes a step of “applying a protective coating to the surface”. It is unclear what protective coating is the coating of line 3 or if the coating is an independent coating.

- b. The phrase “conversion layer is transformed to titanium aluminide” in claim 21 and 23-24 render the claims indefinite because the claim recites a product and the use of the method step of transforming makes it unclear what structure the product has. For example, does the claim have an “aluminum conversion layer” or “titanium aluminide”?

Further with respect to claim 23, the last two lines recite the step of transforming as occurring both “during heat treatment” and “immediately prior to heat treatment”, wherein it is unclear where the transformation takes place.

c. Claims dependent upon the above are likewise rejected under this statute.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Petzoldt et al. 5,300,159

5. Claims 1-2, 4-5, 7-8, 10, 12, 14, 17 and 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Petzoldt et al. 5,300,159 (Petzoldt; cited on IDS filed February 15, 2002).

Petzoldt teaches a method of coating a titanium based article to provide corrosion protection and the resultant article (col 2, lines 8-12), wherein the method of forming the coating includes the steps of applying an aluminum coating (i.e. conversion coating) by ion vapor (i.e. gaseous) deposition to a thickness of less than 12 microns, including the range of 2-12 microns (i.e. less than 0.5 mils) (col 4, lines 30-34), wherein the aluminum coated titanium article is heat treated (i.e. separately from aluminum deposition) in air at 1200-1700°F (i.e. 649°C-927°C) (col 4, lines 37), wherein aluminum undergoes a eutectic reaction or interdiffusion to form a titanium aluminide (col 3, lines 51-57), as recited in claims 1-2, 4-5, 7-8, 10, 12, 17 and 20-24. Petzoldt

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teaches the step of cleaning prior to aluminum deposition, as recited in claims 14 and 17. The claims do not distinguish over the teachings of Petzoldt.

With respect to the specific mechanism of forming the titanium aluminide claimed (e.g. "aluminum oxidizes [to form alumina] and interacts" (claims 1, 8, 12 and 17)), the particular mechanism does not distinguish over the teachings of Petzoldt because one of ordinary skill in the art at the time the invention was made would have considered the invention to have been anticipated because the process steps taught by the reference are the same as the process steps recited in the claims (i.e. heating to a temperature sufficient to cause oxidation in an oxidizing atmosphere (Petzoldt: col 4, lines 37-38)) and therefore one of ordinary skill in the art would expect that the resulting mechanism (i.e. oxidizing and forming of alumina) would necessarily result from the same conditions.

"Where the claimed and prior art products are identical or substantially identical in structure or composition or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, In re Best 195 USPQ 430, 433 (CCPA 1977). 'When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.' In re Spada, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best 195 USPQ 430, 433 (CCPA 1977)." see MPEP 2112.01. [emphasis added by examiner]

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

International Application WO 98/54531 A1

7. Claims 1-5, 7-10, 12 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Application WO 98/54531 A1 (WO '531; cited on IDS filed February 15, 2002).

WO '531 teaches a method of coating a titanium based article, including a brazed article (i.e. claim 25) to provide corrosion protection and the resultant article (abstract), wherein the method of forming the coating includes the steps of applying an aluminum coating (i.e. conversion coating) by gaseous deposition by PVD or LTCVD to a thickness of less than 12 microns, including the range of 2-12 microns (i.e. 1-40 microns) (page 8, first full paragraph), wherein the aluminum coated titanium article is heat treated (i.e. separately from aluminum deposition) vacuum to around 1200°F (i.e. 649°C) with a hold and with a heating from 1000°F (i.e. 538°C) to the hold temperature and a cooling back down to 1000°F (page 9, first full paragraph), wherein aluminum undergoes a interaction with the titanium substrate to form a titanium aluminide (page 8, first full paragraph), as recited in claims 1-5, 7-10, 12 and 20-25 (page 8):

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More particularly oxidation of the titanium or braze clad titanium is prevented by a coating 30 that can be applied to protect or transform the titanium surface. In this example conversion coating in a gaseous phase can be applied to and deposited on an assembled and brazed heat exchanger assembly to ensure coverage of all of the exposed parts of the complex heat exchanger configuration. This coated assembly is then heat treated in a vacuum furnace (not shown) to activate the conversion coating and transform the titanium into an oxidation resistant titanium aluminide with an alumina surface, which also prevents oxidation. In this example the gaseously deposited conversion coating can be aluminum in a thickness of 1-40 microns. Upon heat treatment and activation, the aluminum interacts with the titanium to form an oxidation resistant titanium aluminide. The resultant coating provides oxidation resistance both at 1300 and 1400°F

WO '531 teaches that the heat treatment results in an oxidation of the aluminum layer and formation of aluminum oxide (i.e. alumina) during the interaction with the titanium substrate (page 9, lines 1-5), as recited in claims 1, 8, 12 and 25.

WO '531 fails to meet all the limitations of the instant claims in that WO '531 does not explicitly teach the exact range of thickness or the exact temperatures of heat treatment.

However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the thickness of the aluminum layer taught by the reference overlaps that of the instant claims, In re Peterson, 65 USPQ2d 1379, In re Malagari, 182 USPQ 549, and MPEP 2144.05.

With respect to the heat treatment temperatures, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the temperatures taught by the reference overlap or are so near so as to be expected to have the same effect as that of the instant claims, In re Malagari, 182 USPQ 549, Titanium Metals v. Banner, 227 USPQ 773 and MPEP 2144.05.

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Petzoldt et al. 5,300,159

8. Claims 3, 9, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petzoldt et al. 5,300,159 (Petzoldt).

Petzoldt teaches and is applied as set forth above in paragraph 5.

Petzoldt fails to meet all the limitations of the instant claims in that Petzoldt does not explicitly teach the exact heat treatment temperatures.

With respect to the heat treatment temperatures, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the temperatures taught by the reference overlap or are so near so as to be expected to have the same effect as that of the instant claims, In re Malagari, 182 USPQ 549, Titanium Metals v. Banner, 227 USPQ 773 and MPEP 2144.05.

Petzoldt et al. 5,300, 159 and International Application WO 98/54531 A1 in view of Marder, Arnold "Effects of Surface Treatments on Material Performance: Deposition Surface Treatments", ASM Handbook, Volume 20, 1997, pages 1-18

Claims 6, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petzoldt et al. 5,300,159 (Petzoldt) and International Application WO 98/54531 A1 (WO '531) in view of Marder, Arnold "Effects of Surface Treatments on Material Performance: Deposition Surface Treatments", ASM Handbook, Volume 20, 1997, pages 1-18 (ASM Handbook).

Petzoldt and WO '531 teach and are applied as set forth above in paragraphs 5 and 7.

WO '531 fails to meet all the limitations of the instant claims in that WO '531 does not explicitly teach the temperatures of deposition.

ASM Handbook teaches the temperatures of deposition for PVD processes, such as the processes taught in both Petzoldt and WO '531, wherein the temperatures are within the range of the temperatures claimed for the application of the aluminum conversion coating ("Physical Vapor Deposition", Table 15, page 13).

One of ordinary skill in the art would have found claims 6, 11 and 13 obvious because one of ordinary skill in the art would have found the particular temperatures claimed are temperatures conventionally used for the processes taught in Petzoldt and WO '531, as taught in the ASM Handbook ("Physical Vapor Deposition", Table 15, page 13).

Allowable Subject Matter

9. Claims 15 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

a. A primary reason for the allowance of claims 15 and 18 is that the prior art fails to teach or suggest, either alone or in combination, the instantly claimed method, wherein the method includes the step of cleaning the surface of the titanium-based alloy surface prior to aluminum deposition with a dilute caustic solution of KOH, as instantly claimed.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew L. Oltmans whose telephone number is 703-308-2594. The examiner can normally be reached 7:00-3:30 Monday-Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in black ink, appearing to read 'A. L. Oltmans', with a stylized flourish at the end.

Andrew L. Oltmans
Examiner
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September 10, 2003